Before The

FEDERAL COMMUNICATIONS COMMISSION

Washington, DC 20554

In the Matter of

Amendment to Part 87 of the	)	
Commission's Rules to Permit	)	
Automatic Operation of	)	WT Docket No 96-1
Aeronautical Advisory Stations	)	
(Unicoms)	)	

REPLY TO COMMENTS
POTOMAC AVIATION TECHNOLOGY CORPORATION

Reply with Consensus to

Comments of the Federal Aviation Administration

Reply to Comments of the Artais Corporation

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Potomac Aviation Technology Corporation hereby submits its reply to comments in the above captioned proceeding. PATC has discussed the matters herein at length with the Federal Aviation Administration (FAA), the Aircraft Owners and Pilot's Association (AOPA), the National Business Aircraft Association (NBAA) and the General Aviation Manufacturers Association (GAMA). Specifically, PATC offers below a Reply with Consensus to the earlier Comments of the FAA.

PATC has been developing the state of the art in automated unicom systems for over two years under a developmental license issued by the Federal Communications Commission (FCC). During this period this technology has proven itself valuable to flight safety and beneficial to the flying public.

During the developmental period PATC's Automated Unicom has been demonstrated at a variety of differing airports across the United States; at the Federal level to the FAA, at the State level to the heads of the State Aviation Administrations (NASAO), and to industry through the General Aviation trade groups (AOPA, NBAA, GAMA). During these discussions, valid policy and technical issues have been raised and the benefits of Automated Unicom has been universally supported and non-controversial.

PATC shares the perspective with FAA and FCC that the authorization of Automated Unicom technology must have sufficient guidelines to inadvertently preclude chaos. PATC's Reply to Comments below offers a discussion and review of the issues posed by the FAA, and suggests language and guidelines that may be

incorporated within the published FCC regulations. PATC requests that these guidelines become part of the final Report and Order, where applicable, also referring specifically to the continued authority of the FAA to issue subsequent Advisory Circulars (AC's) to better define Automated Unicom operations as appropriate.

BACKGROUND

Of the approximately 14,000 airports within the United States, some 700 have Air Traffic Control Towers (Controlled airports), and of the remaining 13,000 non-towered airports (Uncontrolled airports) some 1,000 of these have automated weather observation systems (AWOS/ASOS) to meet the visibility and altimeter reporting requirements of certain commercial flight operations. This leaves approximately 12,000 airports that must rely on intermittent and inconsistent air-to-air and air-to-ground communications for runway information and air-traffic separation. The implementation of Automated Unicom will improve public safety at the many Uncontrolled airports as well as at Controlled airports during those hours when the air-traffic control tower may be closed.

At Controlled airports the Air Traffic Control Tower (Tower) uses several frequencies to coordinate air traffic operations. These include separate frequencies for Approach Control, Tower, Clearance Delivery, Departure Control, Ground Services, and Air Traffic Information Service (ATIS). At Uncontrolled airports these functions are coordinated between the aircraft themselves and ground services where available on one Common Traffic Advisory Frequency (CTAF).

At an Uncontrolled airport, where a ground station is available the airport's CTAF is referred to as a "Unicom." Where no ground station exists the CTAF is referred to as "Multicom." Whether a ground station is manned or not, all aircraft use the airport's CTAF frequency to obtain runway information and to maintain air-traffic separation.

Because of the scarcity of available spectrum, combined with the need for aircraft to be able to monitor each other's position reports to maintain traffic separation, well-designed and well-mannered Automated Unicoms must be capable of operating on an airport's Unicom/CTAF frequency. The regulatory challenge is to define and codify the requirements of being well-designed and well-mannered.

REPLY TO COMMENTS OF THE FAA

CONSENSUS AND DISCUSSION

Upon review of the FAA's preliminary comments to FCC NPRM WT-96-1, PATC and the FAA have had extensive discussions of the issues raised. This Reply to Comments reflects discussions with senior, qualified personnel at FAA Headquarters, including Myron Clark - FAA Weather, Ken Krouse - FAA AWOS/ASOS programs, Steve Isaacs - FAA Flight Standards, and Don Nellis - FAA Spectrum Management.

FAA ITEM 1)

"Weather information to be announced as ADVISORY, VFR ONLY"

Similar language had been proposed with PATC's initial developmental authorization. Upon consideration the FAA, FCC and PATC agreed that the use of the term "ADVISORY" sufficiently distinguished the information provided from that of an "Observation," a different type of report that is required for Instrument-Flight-Rules (IFR) low visibility operations. It was further agreed that the phrase "VFR Use Only," as well as becoming redundant given the inclusion of "Advisory," could dangerously mislead IFR aircraft into expecting VFR conditions to exist at the runway surface.

PATC and the FAA suggest language below that further precludes any Automated Unicom from providing either Altimeter or Visibility at airports having an instrument approach unless such information has been certified by the FAA. Since Altimeter and Visibility are herein precluded at all IFR airports the disclaimer "VFR USE ONLY" becomes redundant. With mutual agreement the term "Advisory" is retained and the phrase "VFR Use Only" is removed.

Automated Unicom weather information will be announced as "Advisory,"

FAA ITEM 2)

"Altimeter (barometric pressure) reporting over automated unicoms only at airports which have no IFR approaches."

Both for safety and liability, PATC concurs with the FAA that an altimeter value can provide valuable supplemental information at airports operating under Visual-Flight-Rules (VFR), but for airports having IFR operations both altimeter and visibility sources must have FAA approval and certification. The FAA and PATC suggest language that would continue to allow the FAA to approve such sources. PATC also offers expanded language to preclude the installation of ANY uncertified altimeter or visibility sensors that might be inadvertently misconstrued as being authorized for any IFR operations.

Automated Unicom shall not provide Altimeter nor Visibility at airports having an IFR approach unless certified by the FAA in accordance to AC 150-5220-16.

FAA ITEM 2(a)

"No weather broadcasting where an AWOS/ASOS is installed."

As is the case for altimeter certification, final discretion for the approval of Automated Unicom where AWOS/ASOS is installed should remain with the FAA. The FCC's language should permit the FAA the authority to employ Automated Unicom as an alternative outlet means for AWOS/ASOS information, for example, where no other outlet means may be available.

Automated Unicom will not broadcast weather where an AWOS/ASOS is installed, unless certified by the FAA in accordance with AC 150-5220-16.

FAA ITEM 2(b)

"FAA requests that the weather sensors be sited in a clear area that best represents the airport conditions."

PATC concurs with the FAA that this offers a good, practical and reasonable guideline for Automated Unicom sensor placement.

Weather sensors must be sited in a clear area that best represents the airport conditions.

FAA ITEM 2) (sic) *"Automated Unicom transmit power is limited to 1/2 watt in order to minimize interference on Unicom frequencies."*

While FCC licensing allows unicom stations to have up to 10 watts transmit power (87.131, A3E Authorized emissions), in practice PATC has found that 1/2 watt transmission power:

A) Allows aircraft to monitor Automated Unicom transmissions for 10-15 miles from the airport, and

B) Allows other aircraft transmissions to be heard over any transmissions from the Automated Unicom.

The FAA expressed some surprise that 1/2 watt had been found to be sufficient by PATC. In review PATC concurred that there may be situations where topography, structures and the like may reduce the effective range of 1/2 watt transmissions. While 1/2 watt offers an acceptable standard, there may be occasions to permit 2 watts to provide sufficient coverage, on the order of 15 miles from the facility.

Automated Unicom transmit power is limited to 1/2 watt, in order to minimize interference on unicom frequencies, but may be increased to 2 watts where the airport can demonstrate that 1/2 watt will not provide 15 miles range.

FAA ITEM 3)

"Automated Unicom be assigned only to 25 KHz Unicom channels."

The FAA has stated publicly that the purpose of the FAA's comment on this matter was to be consistent with the FAA's existing general spectrum management policy to place all new technologies onto 25 KHz frequencies as an incentive for aircraft operators to upgrade their aircraft radios to the new 25 KHz standard. With respect to this policy, there remains a considerable number of aircraft as yet unable to receive the 25 KHz channel separation. Thus it becomes impractical and unsafe to currently impose the 25 KHz channel policy on an airport's Unicom where such frequencies would deny many aircraft the essential flight-safety function of Unicom/CTAF.

The FAA acknowledges that unconditionally requiring Automated Unicoms to be on 25 KHz Unicom channels would either:

A) Require airports to change their basic unicom/CTAF to 25 KHz Unicom frequencies, which in many cases would create a serious safety hazard, or

B) Would so dramatically reduce the benefits of Automated Unicom as to all but eliminate its implementation.

For practicality, utility and safety, Automated Unicom need to be available on airport CTAF frequencies that do not arbitrarily deny many aircraft their ability to communicate with other aircraft and to maintain traffic separation. In recognition of the FAA's long-term spectrum goals, language can encourage the use of the alternative 25 KHz Unicom frequencies where safety will not be compromised. This determination must be made on a case by case basis by the airport operator who can best qualify the types of aircraft operating at their facility.

Automated Unicom may operate on an airport's existing Unicom/CTAF frequency. Where a new Unicom/CTAF is being established for an Automated Unicom the frequency assigned shall be one of the 25 KHz unicom frequencies.

The driving force behind the FAA and the FCC's to offer alternative 25 KHz channel frequencies in the aviation band is to provide alternatives to the congested 100 KHz and 50 KHz channel frequencies already in heavy use.

To improve public safety and to reduce congestion on the limited Unicom frequencies currently available, PATC and the FAA strongly suggest that the FCC use this opportunity to remove an inadvertent administrative restriction that currently precludes an airport from upgrading its currently assigned Multicom/CTAF frequency to offer a higher level of the same services as a Unicom/CTAF. PATC and the FAA, including discussion with the industry trade groups, offer that the FCC should recognize that un-controlled airports that are already using their already assigned Multicom frequency for CTAF may improve safety by the addition of a ground based station (making the frequency a Unicom/CTAF) without requiring the unnecessary assignment of a new CTAF frequency.

Since an airport's CTAF assignee and the entire function of the airport's CTAF frequency would remain as they currently are, only allowing an upgrading of existing multicom services through the addition of a ground based station, such an administrative allowance by the FCC is not controversial in any manner with any agency nor with any trade organization. This issue pertains directly to the current authorization of Automated Unicom as it similarly addresses the scope of Unicom use.

The frequencies assignable to unicom are:

87.217 (a)

(2) 122.70, 122.725, 122.800, 122.975, 123.000, 123.050, 123.075 at all other airports, *or the multicom frequencies of 122.850 or 122.900 at uncontrolled airports where the airport's assigned multicom also serves as the airport's CTAF.*

FAA ITEM 4)

Where unicom is also a CTAF, limit the information broadcast over the Automated Unicom to the items specified in 87.213(b)(1).

The FAA states the purpose of this limitation is to restrict the scope of Automated Unicom to aviation related information and to preclude the use of inappropriate ground or other commercial messages. PATC concurs with the purpose and intention of this language.

Where unicom is also a CTAF, limit the information broadcast over the Automated Unicom to the items specified in 87.213(b)(1).

PATC offers that language be expanded to further define the authorization of Automated Unicom systems to a standard acceptable to the FAA, and which would also provide the FAA a broader "veto authority" which the FAA could use to preclude the installation of any Automated Unicom systems that it considers unacceptable:

"Automated Unicom systems must sufficiently emulate existing and approved Unicom/CTAF services."

FAA ITEM 5)

"The Automated Unicom transmission needs to be less than one minute. The continuous transmission limit of three minutes is too long and Automated Unicoms must be designed so that they will automatically shut down after one minute of continuous operation."

In practice PATC has found that one minute is more than adequate for even the longest advisory message, including the addition of a reasonable NOTAM. Safeguards to eliminate the possibility of an Automated Unicom transmission getting "stuck" while transmitting also makes good sense.

Automated Unicom message needs to be limited to less than one minute. Unicoms must be designed to shut down after one minute of continuous operation.

FAA ITEM 6)(a)

"Automated Unicoms incorporate a preemption feature to terminate Automated Unicom broadcast if another transmission is detected. The Automated Unicom currently being tested by PATC utilizes this type of preemption."

What the FAA interpreted as a "preemption feature" by PATC's Automated Unicom was in fact merely the planned by-product of limiting the system's transmit power. Transmissions from aircraft, rated at 5 watts or more, can typically be heard over the 1/2 watt transmission of the Automated Unicom. The FAA concurs that this is a beneficial result of limited power and concurs that a secondary remote detector would be both redundant and impractical.

Limiting Automated Unicom transmit power achieves the result desired.

FAA ITEM 6(b)

> *"FAA Supports the requirement that the Automated Unicom monitor the frequency before transmitting, but believes that three seconds is probably too short a period and recommends five seconds prior to transmitting."*

After PATC and FAA discussion and consideration of the practical implications of introducing an unnatural delay after a specific action has been requested by an aircraft, particularly during peak times on unicom, the FAA and PATC concurred that Automated Unicoms must first, prior to transmitting, confirm that the frequency is clear, but that after doing so must reply with the information quickly and without unnecessary delay.

Automated Unicom must

> **(1) Monitor the unicom frequency prior to transmission, and transmit only when the frequency has been clear for a brief period of time.**

PATC offers that the FCC's Report & Order should specifically state that the FAA may further define the function and characteristics of Automated Unicom systems through subsequent Advisory Circulars (AC's).

FAA ITEM 6)(c)

> *"FAA supports the requirement that Automated Unicom systems only transmit in response to brief keyed RF signals."*

Prior to the FAA's exposure to the application of using a pattern recognition of RF transmissions, it generally made sense to limit Automated Unicoms to responding only to brief microphone clicks. After review of a working system, the practical question remains as to how to codify language that can permit a valuable service but which will also preclude inappropriate transmissions.

While it would be impractical to define the subtlety of response characteristics within the body of the FCC regulations, it is practical to give the FAA a veto method to disapprove inappropriate responses by Automated Unicom systems.

In the original comments PATC had proposed the language *"Transmit only in response to communication or brief RF signals from aircraft stations as specified in 87.187(y)."* To more specifically narrow the scope and nature of automated response and to provide the FAA with a veto authority, the following language is suggested:

> **(2) "Transmit only in response to aircraft in need of unicom services in a manner acceptable to the FAA"**

While eliminating the possibility of random transmissions this language also sets a high standard for Automated Unicoms to be able to identify circumstances where information would be useful; such as responding to the blind inbound call of an aircraft with an identifier and often critical NOTAM information:

> *Example 11PM:*
>
> *Aircraft:* *"N86121 inbound from the South, request advisories"*
>
> *(Pause to allow others to reply, if they will)*
>
> *A-Unicom:* *"Potomac Airfield, Automated Unicom, enter 3 clicks for advisory, 4 clicks for radio-check. Runway 31 closed for repairs"*

FAA ITEM 6)(d)

> *"The FAA concurs with the date and time stamp requirement. If however, the Automated Unicom is receiving information from automated sensors, then a notification of automatic operations could be substituted for the date and time stamp. Under these conditions, a sunset time may also be incorporated which would remove the items from the automated transmission if valid sensor update has not been received within the last minute."*

The FAA identifies two forms of Automated Unicom, one that has pre-recorded, and therefore potentially dated information, and a second type that uses current automated sensor information.

PATC and the FAA agree on the application of date and time stamps where pre-recorded information may be used, and also agree on the alternative "Automated Advisory" message that may be used where automated data is employed. Furthermore, the suppression of data that has been invalid for more than one minute also makes good sense. More concise language is suggested.

> **Where an Automated Unicom may rely on dated information the message must contain a date and time stamp. Alternatively, where the Automated Unicom employs automated sensors giving current information the phrase "Automated Advisory" must be included in the message and any sensor data that has been invalid for more than one minute shall not be given.**

FAA ITEM 7)

> *"Only one Automated Unicom at Controlled airports where more than one unicom may be in operation."*

PATC concurs with the FAA that one Automated Unicom per airport is a practical limit.

> ***"Only one Automated Unicom at Controlled airports where more than one unicom may be in operation."***

REPLY TO THE COMMENTS OF ARTAIS CORPORATION

Artais Corporation is a quality manufacturer of Automated Weather Observations Systems. Artais' systems provide the FAA certified altimeter and visibility requirements that the FAA requires for certain commercial operations during IFR low-visibility conditions. In the comments above, except where the FAA elects to provide similar certification at airports with an IFR approach, Automated Unicoms will provide neither altimeter nor visibility.

> **Automated Unicom shall not provide Altimeter nor Visibility at airports having an IFR approach unless certified by the FAA in accordance to AC 150-5220-16.**

Unlike the AWOS/ASOS regulatory environment, the Advisory information provided by Automated Unicom exceeds the current accepted standard of unicom advisory information and will only be used to supplement visual information during VFR operations. The critical values of altimeter and visibility for IFR operations will not be provided unless certified by the FAA.

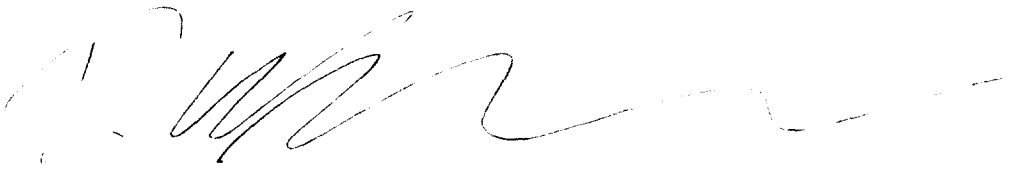
To the extent that the FAA may deem it necessary to establish another standard for Automated Unicom, the FAA has always and will continue to retain such authority.

REPLY TO OTHER COMMENTS

PATC notes that the small number of other comments received by the FCC for the proposed NPRM, regarding Automated Unicom, are in concurrence with the Comments of PATC. PATC has continually fully disclosed the issues with all of the trade organizations relevant to the industry. Trade group Reply-to-Comments are expected to similarly be non-controversial.

CONCLUSION

PATC has greatly benefited from the oversight and dialogue with the Federal Aviation Administration, as well as from the comments and suggestions offered by the many users and regulators of the aviation spectrum. Incorporating the sum of this experience offers an opportunity to rapidly improve public safety and to increase the economic viability of this nation's smaller airports. The Commission is encouraged to move quickly to make such technology available to the public.



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